What is claimed is:

1. A process for manufacturing a light diffusing structure, comprising the step of directing collimated or nearly-collimated light through a transparent or translucent substrate and into a layer of photopolymerizable material for a period of time sufficient to photopolymerize only a portion of the photopolymerizable material.

2. A process as set forth in claim 1, further comprising the step of selecting the substrate from a material from one or more of the classes of (a) amorphous materials; (b) semi-crystalline materials that contain crystalline domains interspersed in an amorphous matrix; and (c) purely crystalline materials.

3. A process as set forth in claim 1, further comprising the step of fabricating the photopolymerizable material from at least one photopolymerizable monomer or oligomer.

4. A process as set forth in claim 1, further comprising the step of fabricating the photopolymerizable material from at least one photopolymerizable monomer or oligomer, and a photoinhibitor.

5. A process as set forth in claim 1, further comprising the step of placing the layer of photopolymerizable material on the substrate.

6. A process as set forth in claim 1, further comprising the step of generating light having a divergence angle of less than ten degrees.

7. A process as set forth in claim 1, further comprising the step of directing the light through the substrate in more than one dose.

8. A process as set forth in claim 1, further comprising the step of removing the unphotopolymerized portion of the photopolymerizable material.

9. A process as set forth in claim 1, further comprising the step of removing the photopolymerized portion of the photopolymerizable material from the substrate.

10. A process as set forth in claim 1, further comprising the steps of:

removing the unphotopolymerized portion of the photopolymerizable material; and

placing transparent or translucent fill material on the surface of the photopolymerized photopolymerizable material.

11. A process as set forth in claim 10, where the step of placing transparent or translucent fill material on the surface of the photopolymerized photopolymerizable material comprises the step of selecting a fill material having an index of refraction less than that of the photopolymerizable material.

12. A process as set forth in claim 10, further comprising the step of placing light-scattering particles in the fill material.

13. A process as set forth in claim 1, further comprising the step of combining the photopolymerized photopolymerizable material with an array of tapered optical waveguides, each tapered optical waveguide comprising:

an input surface that admits light;

an output surface distal from the input surface, the output surface having a surface area less than that of the input surface; and

a sidewall or sidewalls disposed between the input and output surfaces for effecting total reflection of the light rays received by the input surface.

14. A process as set forth in claim 13, where the step of combining the photopolymerized photopolymerizable material with an array of tapered optical waveguides comprises the step of placing the photopolymerized photopolymerizable material in juxtaposition to the input or the output surface of the tapered optical waveguides.

15. A process as set forth in claim 13, where the tapered optical waveguides are lenticular.

16. A process as set forth in claim 1, further comprising the steps of:

removing the unphotopolymerized portion of the photopolymerizable material;

forming a metallic layer on the surface of the photopolymerized photopolymerizable material to form a conforming replica layer; and

applying the metallic replica layer to embossable material.

17. A process as set forth in claim 16, further comprising the step of placing light-scattering particles in the embossable material.

18. A process as set forth in claim 16, further comprising the step of combining the embossable material to which the metallic replica layer has been applied with an array of tapered optical waveguides, each tapered optical waveguide comprising:

an input surface that admits light;

an output surface distal from the input surface, the output surface having a surface area less than that of the input surface; and

a sidewall or sidewalls disposed between the input and output surfaces for effecting total reflection of the light rays received by the input surface.

19. A process as set forth in claim 18, where the step of combining the embossable material with an array of tapered optical waveguides comprises the step of placing the photopolymerized photopolymerizable material in juxtaposition to the input or the output surface of the tapered optical waveguides.

20. A process as set forth in claim 18, where the tapered optical waveguides are lenticular.

21. A process for manufacturing a light diffusing structure, comprising the steps of:

selecting a transparent or translucent substrate from a material from one or more of the classes of (a) amorphous materials; (b) semi-crystalline materials that contain crystalline domains interspersed in an amorphous matrix; and (c) purely crystalline materials, the substrate having first and second surfaces generally flat and parallel to each other;

depositing a layer of photopolymerizable material comprising at least one photopolymerizable monomer or oligomer, and a photoinhibitor, on the first surface of the substrate;

directing collimated or nearly-collimated light through the second surface of the substrate and into the photopolymerizable material for a period of time sufficient to photopolymerize only a portion of the photopolymerizable material; and

removing the unphotopolymerized portion of the photopolymerizable material.

22. An apparatus for manufacturing a light diffusing structure, comprising:

a transparent or translucent substrate;

a layer of photopolymerizable material; and

means for directing collimated or nearly-collimated light through the substrate and into the photopolymerizable material for a period of time sufficient to photopolymerize only a portion of the photopolymerizable material.

23. An apparatus as set forth in claim 22, where the substrate is fabricated from a material from one or more of the classes of (a) amorphous materials; (b) semi-crystalline materials that contain crystalline domains interspersed in an amorphous matrix; and (c) purely crystalline materials.

24. An apparatus as set forth in claim 22, where the photopolymerizable material is fabricated from at least one photopolymerizable monomer or oligomer.

25. An apparatus as set forth in claim 22, where the photopolymerizable material is fabricated from at least one photopolymerizable monomer or oligomer, and a photoinhibitor.

26. An apparatus as set forth in claim 22, where the layer of photopolymerizable material is on the substrate.

27. An apparatus as set forth in claim 22, where the means for directing light generates light having a divergence angle of less than ten degrees.

28. An apparatus as set forth in claim 22, where the means for directing light directs the light through the substrate in more than one dose.

29. An apparatus as set forth in claim 22, further comprising means for removing the unphotopolymerized portion of the photopolymerizable material.

30. An apparatus as set forth in claim 22, further comprising means for removing the photopolymerized portion of the photopolymerizable material from the substrate.

31. An apparatus as set forth in claim 22, further comprising a transparent or translucent fill material on the surface of the photopolymerized photopolymerizable material.

32. An apparatus as set forth in claim 31, where the fill material has an index of refraction less than that of the photopolymerizable material.

33. An apparatus as set forth in claim 31, where the fill material contains light-scattering particles.

34. An apparatus as set forth in claim 22, further comprising an array of tapered optical waveguides, each tapered optical waveguide comprising:

an input surface that admits light;

an output surface distal from the input surface, the output surface having a surface area less than that of the input surface; and

a sidewall or sidewalls disposed between the input and output surfaces for effecting total reflection of the light rays received by the input surface.

35. An apparatus as set forth in claim 34, where the photopolymerized photopolymerizable material is in juxtaposition to the input or the output surface of the tapered optical waveguides.

36. An apparatus as set forth in claim 34, where the tapered optical waveguides are lenticular.

37. An apparatus as set forth in claim 22, further comprising:

means for removing the unphotopolymerized portion of the photopolymerizable material;

means for forming a metallic layer on the surface of the photopolymerized photopolymerizable material to form a conforming replica layer; and

means for applying the metallic replica layer to embossable material.

38. An apparatus as set forth in claim 37, where the embossable material contains light-scattering particles.

39. An apparatus as set forth in claim 37, further comprising an array of tapered optical waveguides, each tapered optical waveguide comprising:

an input surface that admits light;

an output surface distal from the input surface, the output surface having a surface area less than that of the input surface; and

a sidewall or sidewalls disposed between the input and output surfaces for effecting total reflection of the light rays received by the input surface.

40. An apparatus as set forth in claim 39, where the photopolymerized photopolymerizable material is in juxtaposition to the input or the output surface of the tapered optical waveguides.

41. An apparatus as set forth in claim 39, where the tapered optical waveguides are lenticular.

42. An apparatus for manufacturing a light diffusing structure, comprising:

a transparent or translucent substrate fabricated from a material from one or more of the classes of (a) amorphous materials; (b) semi-crystalline materials that contain crystalline domains interspersed in an amorphous matrix; and (c) purely crystalline materials, the substrate having first and second surfaces generally flat and parallel to each other;

a layer of photopolymerizable material, comprising at least one photopolymerizable monomer or oligomer, and a photoinhibitor, deposited on the first surface of the substrate;

a light source for directing collimated or nearly-collimated light through the second surface of the substrate and into the photopolymerizable material for a period of time sufficient to photopolymerize only a portion of the photopolymerizable material; and

means for removing the unphotopolymerized portion of the photopolymerizable material.

43. An optical diffuser comprising photopolymerizable material exposed to a source of collimated or nearly-collimated light first directed through a transparent or translucent substrate for a period of time sufficient to photopolymerize only a portion of the photopolymerizable material.

44. An optical diffuser as set forth in claim 43, where the substrate is fabricated from a material from one or more of the classes of (a) amorphous materials; (b) semi-crystalline materials that contain crystalline domains interspersed in an amorphous matrix; and (c) purely crystalline materials.

45. An optical diffuser as set forth in claim 43, where the photopolymerizable material is fabricated from at least one photopolymerizable monomer or oligomer.

46. An optical diffuser as set forth in claim 43, where the photopolymerizable material is fabricated from at least one photopolymerizable monomer or oligomer, and a photoinhibitor.

47. An optical diffuser as set forth in claim 43, where the photopolymerizable material is on the substrate.

48. An optical diffuser as set forth in claim 43, where the light has a divergence angle of less than ten degrees.

49. An optical diffuser as set forth in claim 43, where the light is directed through the substrate in more than one dose.

50. An optical diffuser as set forth in claim 43, further comprising a layer of transparent or translucent fill material on the surface of the photopolymerized photopolymerizable material.

51. An optical diffuser as set forth in claim 50, where the fill material has an index of refraction less than that of the photopolymerizable material.

52. An optical diffuser as set forth in claim 50, where the fill material contains light-scattering particles.

53. An optical diffuser as set forth in claim 43, further comprising an array of tapered optical waveguides, each tapered optical waveguide comprising:

an input surface that admits light;

an output surface distal from the input surface, the output surface having a surface area less than that of the input surface; and

a sidewall or sidewalls disposed between the input and output surfaces for effecting total reflection of the light rays received by the input surface.

54. An optical diffuser as set forth in claim 53, where the photopolymerized photopolymerizable material is in juxtaposition to the input or the output surface of the tapered optical waveguides.

55. An optical diffuser as set forth in claim 53, where the tapered optical waveguides are lenticular.

56. An optical diffuser comprising photopolymerizable material, comprising at least one photopolymerizable monomer or oligomer, and a photoinhibitor, exposed to a source of collimated or nearly-collimated light first directed through a transparent or translucent substrate, the substrate being fabricated from a material from one or more of the classes of (a) amorphous materials; (b) semi-crystalline materials that contain crystalline domains interspersed in an amorphous matrix; and (c) purely crystalline materials, for a period of time sufficient to photopolymerize only a portion of the photopolymerizable material.

57. An apparatus for manufacturing a light diffusing structure, comprising a metallic layer formed on a layer of photopolymerizable material exposed to a source of collimated or nearly-collimated light first directed through a transparent or translucent substrate for a period of time sufficient to photopolymerize only a portion of the photopolymerizable material after the unphotopolymerized portion of the photopolymerizable portion has been removed.

58. An apparatus as set forth in claim 57, where the substrate is fabricated from a material from one or more of the classes of (a) amorphous materials; (b) semi-crystalline materials that contain crystalline domains interspersed in an amorphous matrix; and (c) purely crystalline materials.

59. An apparatus as set forth in claim 57, where the photopolymerizable material is fabricated from at least one photopolymerizable monomer or oligomer.

60. An apparatus as set forth in claim 57, where the photopolymerizable material is fabricated from at least one photopolymerizable monomer or oligomer, and a photoinhibitor.

61. An apparatus as set forth in claim 57, where the photopolymerizable material is on the substrate.

62. An apparatus as set forth in claim 57, where the light source generates light having a divergence angle of less than ten degrees.

63. An apparatus as set forth in claim 57, where the light source generates light in more than one dose.

64. A mold for manufacturing a light diffusing structure, comprising a metallic layer formed on a layer of photopolymerizable material, comprising at least one photopolymerizable monomer or oligomer, and a photoinhibitor, exposed to a source of collimated or nearly-collimated light first directed through a transparent or translucent substrate, the substrate being fabricated from a material from one or more of the classes of (a) amorphous materials; (b) semi-crystalline materials that contain crystalline domains interspersed in an amorphous matrix; and (c) purely crystalline materials, for a period of time sufficient to photopolymerize only a portion of the photopolymerizable material after the unphotopolymerized portion of the photopolymerizable portion has been removed.